UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,040	10/30/2003	David Hait	5013.005	1172

7590 03/12/2009

Law Office of Morris E. Cohen, Esq.
Suite 217
1122 Coney Island Avenue
Brooklyn, NY 11230-2345

EXAMINER	
SEE, CAROL A	

ART UNIT	PAPER NUMBER
3696	

MAIL DATE	DELIVERY MODE
03/12/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/698,040	HAIT, DAVID	
	Examiner	Art Unit	
	Carol See	3696	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/29/2008 has been entered.

Response to Amendment

2. Responsive to applicant's Arguments/Remarks, submitted 10/29/2008, Examiner acknowledges addition of dependent claim 9.

3. Applicant amendment of claim 5 to include the claimed equation addresses previous rejection under 35 USC 112 and necessitates additional rejections. Please see below.

Response to Arguments

4. Applicant's arguments filed 2/1/2008 and 10/29/2008 have been fully considered but they are not persuasive.

5. Applicant argues (pg. 9, 2/1/2008) that "node vega is a novel specific quantity calculated in a specific way for the implied volatility determination covered by the claim,...". Examiner notes that the current action addresses this assertion as being

manipulation of variables and mathematical formulations well known in the art of options pricing. Please see below.

Requirement for Information under 37 CFR 1.105

6. Examiner acknowledges Applicant's response (2/1/2008) to requirement for information.

Priority

7. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 120 as follows:

The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application). The disclosure of the invention in the parent application and in the later-filed application must be sufficient to comply with the requirements of the first paragraph of 35 U.S.C. 112. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994).

The disclosure of the prior-filed application, Application No. 60/422,231 fails to provide adequate support or enablement in the manner provided by the first paragraph of 35 U.S.C. 112 for one or more claims of this application. Accordingly, claims 5-8 are not entitled to the benefit of the prior application because there is not adequate support

in the provisional application; therefore, claims 5-8 are only granted a priority date of October 30, 2003 (the filing date of Applicant's non-provisional application).

Claim Objections

8. Claims 2-4, 6-9 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Independent claims 1 and 5, from which claims 2-4 and 6-9 respectively depend, recite a computing device structure. The time at which a node vega is calculated, the use of a CRR binomial tree, and the calculation of implied volatility do not serve to further limit the claimed structure of a computing device.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1 and 5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 2-4 are rejected as depending from claim 1. Claims 6-9 are rejected as depending from claim 5.

Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which

was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant has amended claims to include the recitation "wherein said device determines the implied volatility by division of the period until option expiration into sub-periods, wherein period to expiration is subdivided into a number of time periods and possible underlying asset price values, and by calculation of a node vega, said node vega being the exact derivative of the option price with respect to the volatility at the end of at least one of said subperiods and at one or more of said underlying asset price values." Applicant's inclusion of the underlined phrases fails to find support in applicant's specification as originally filed, thus constituting new matter.

Further, as to claim 1, the meaning of the "wherein" clause cited above is unclear. Does the device determine possible underlying price values or divide the period into possible price values? Further, applicant's definition of "node vega" is unclear and the difference between applicant's claimed "new" invention and the "vega," both used to determine implied volatility remains unclear. How the "new" invention is used to determine implied volatility remains unclear. Examiner respectfully notes that, in the specification, applicant appears to use the terms "vega" and "node vega" interchangeably. For example, although applicant refers to node vega as an exact derivative, applicant represents the term in equation form (Equation 6) as a partial derivative.

Further, in claim 1, the meaning of "possible underlying asset price values" is unclear.

Claim 1 recites the limitation "the volatility" in line 5. There is insufficient antecedent basis for this limitation in the claim.

As to claim 5, the claim lacks clarity because the meanings of the terms of the equation are not defined in the body of the claim.

Claim Rejections - 35 USC § 101

11. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

12. Claims 1- 9 are rejected under 35 U.S.C. 101 because the claimed invention pre-empts a judicial exception.

Under the statutory requirement of 35 U.S.C. § 101, a claimed invention must produce a useful, concrete, and tangible result. For a claim to be useful, it must yield a result that is specific, substantial, and credible (MPEP § 2107). A concrete result is one that is substantially repeatable, i.e., it produces substantially the same result over and over again (*In re Swartz, 232 F.3d 862, 864, 56 USPQ2d 1703, 1704 (Fed. Cir. 2000)*). In order to be tangible, a claimed invention must set forth a practical application that generates a real-world result, i.e., the claim must be more than a mere abstraction (*Benson, 409 U.S. at 71-72, 175 USPQ at 676-77*). Additionally, a claim may not preempt abstract ideas, laws of nature or natural phenomena nor may a claim preempt every “substantial practical application” of an abstract idea, law of nature or natural phenomena because it would in practical effect be a patent on the judicial exceptions themselves (*Gottschalk v. Benson, 409 U.S. 63, 71-72 (1972)*). (Please refer to the

"Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" for further explanation of the statutory requirement of 35 U.S.C. § 101.)

13. In the instant case, Applicant's claims 1- 8 comprise a judicial exception - an abstract idea in the form of a mathematical algorithm (i.e., division and calculation as recited in claims 1-3 and 5-7). Applicant makes practical application of the mathematical algorithm in that a useful, concrete and tangible result is produced.

However, Applicant further recites calculation of a value and calculation of that value using a cited equation. The instant claims would impermissibly cover every substantial practical application of Applicant's claimed method, and thereby preempt all use of the equation. For example, non-option financial instruments can also have an implied volatility for which calculation of vega is required. The value over the long term of insurance contracts, asset portfolios, asset procurements, and a host of other business decisions can be covered by the broad scope of the claimed invention. Consequently, the claimed invention attempts to preempt all practical applications of the judicial exception which is improper under 35 U.S.C. § 101.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. Claim 1-3, 5-7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makivic (U.S. 6,061,662).

As to claims 1 and 5, Makivic shows a machine comprising:

a computing device for determining implied volatility in options pricing, wherein said device determines the implied volatility by division of the period until option expiration into sub-periods and possible underlying asset price values, and by calculation of a node vega, said node vega being the exact derivative of the option price with respect to the volatility at the end of at least one of said subperiods and at one or more of said underlying asset price values (col. 3, lines 1-2, in conjunction with Table 2 and Table 3, wherein period to expiration is subdivided into a number of time periods until maturity and Table 2 comments identifying derivative of option price with respect to volatility).

Makivic does not expressly show calculation of an exact derivative of option price with respect to volatility. However, for one of ordinary skill in the art, it would be an obvious design choice to incorporate exact derivates as functions of partial derivatives into the mathematical means for deriving a measure of implied volatility. Since the invention fails to provide any unexpected results from its usage, use of any

mathematical means, including that of the claimed invention would be an obvious matter of design choice within the skill of the art.

Further, the recitation "for determining implied volatility in options pricing, wherein…" is not afforded patentable weight because the language constitutes nonfunctional descriptive material that fails to further limit the scope of the claimed computing device. This language does not alter the recited structural elements which remain the same regardless of the specific calculations being done using the structure. Thus, this descriptive material will not distinguish the claimed invention from the prior art in terms of patentability, *see In re Gulack, 703 F.2d 1381, 1385, 217 USPQ 401, 404 (Fed. Cir. 1983); In re Lowry, 32 F.3d 1579, 32 USPQ2d 1031 (Fed. Cir. 1994); MPEP § 2106.*

As to claims 2 and 6, Makivic shows all elements of claims 1 and 5, respectively. Makivic further shows wherein said node vega is calculated at the end of a plurality of said subperiods (see Table 2 and Table 3, wherein period to expiration is subdivided into a number of time periods until maturity, which encompasses a calculation of other values at those periods).

Although the reference addresses the claim language, Examiner notes that the recitation "wherein said node vega is calculated at the end of a plurality of said subperiods" constitutes nonfunctional descriptive material. Applicant recites a computing device. A recitation of what is computed fails to alter the structure of the claimed computing device. Thus, this nonfunctional descriptive material will not distinguish the claimed invention from the prior art in terms of patentability, see *In re*

Gulack, 703 F. 2d 1381, 1385, 217 USPQ 401, 404 (Fed. Cir. 1983); *In re Lowry*, 32 F. 3d 1579, 32 USPQ 2d 1031 (Fed. Cir. 1994).

As to claims 3 and 7, Makivic shows all elements of claims 1 and 5. Makivic further shows wherein said machine calculates implied volatility for American options (col. 2, lines 59-62 in conjunction with col. 3 lines 1-2 and 14-15).

Although the reference addresses the claim language, Examiner notes that the recitation "wherein said machine calculates implied volatility for American options" constitutes nonfunctional descriptive material. Applicant recites a computing device. A recitation of what is computed fails to alter the structure of the claimed computing device. Thus, this nonfunctional descriptive material will not distinguish the claimed invention from the prior art in terms of patentability, see *In re Gulack*, 703 F. 2d 1381, 1385, 217 USPQ 401, 404 (Fed. Cir. 1983); *In re Lowry*, 32 F. 3d 1579, 32 USPQ 2d 1031 (Fed. Cir. 1994).

As to claim 9, Makivic shows all elements of claim 5. Makivic further shows wherein said node vega is calculated at the beginning of a plurality of said subperiods (see Table 2 and Table 3, wherein period to expiration is subdivided into a number of time periods until maturity, which encompasses a calculation of other values at those periods, designated as beginning or end).

Although the reference addresses the claim language, Examiner notes that the recitation "wherein said node vega is calculated at the beginning of a plurality of said subperiods" constitutes nonfunctional descriptive material. Applicant recites a computing device. A recitation of what is computed fails to alter the structure of the

claimed computing device. Thus, this nonfunctional descriptive material will not distinguish the claimed invention from the prior art in terms of patentability, see *In re Gulack*, 703 F. 2d 1381, 1385, 217 USPQ 401, 404 (Fed. Cir. 1983); *In re Lowry*, 32 F. 3d 1579, 32 USPQ 2d 1031 (Fed. Cir. 1994).

16. Claims 4 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makivic in view of applicant's admission of Cox- Ross-Rubinstein (CRR) binomial tree as well-known in the art.

Makivic shows all elements of claims 1 and 5.

Makivic does not specifically show wherein said calculation is conducted using a Cox- Ross-Rubinstein (CRR) binomial tree.

Applicant acknowledges that CRR is an industry-wide standard for options pricing (first paragraph of applicant's detailed description of invention).

It would have been obvious to one of ordinary skill in the art to have modified the method disclosed by Makivic in order to employ calculation standards well known in the art because of their flexibility in handling different types of options.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Ninomiya et al. (U.S. 6,879,974) – shows method and system for constricting a discrete model using a multinomial tree structure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol See whose telephone number is (571)272-9742. The examiner can normally be reached on Monday - Thursday 6:45 am - 5:15 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Dixon, can be reached on (571) 272-6803. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ella Colbert/
Primary Examiner, Art Unit 3696

Carol See
Patent Examiner
Art Unit 3696